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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/527,699

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Shu Kobayashi

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EXAMINER

LEE, RIP A

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/527,699	Applicant(s) KOBAYASHI ET AL.	
	Examiner RIP A. LEE	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 January 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-20 is/are rejected.
- 7) ☒ Claim(s) 1 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

This office action follows a response filed on January 2, 2008. Claims 1, 4, 6, 9-15, 17, 19, and 20 were amended. Claim 8 was canceled. Claims 1-7 and 9-20 are pending.

Claim Objections

1. Claim 1 is objected to because of the following informalities: In line 11 of the claim, please replace "1) the monomer" with "1) a monomer." In line 49 of the claim, replace "2) the monomer" with "2) a monomer." Appropriate corrections are required.
2. Claim 15 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The structural features of monomer III, recited in claim 15, are identical to those recited in claim 14. Therefore, claim 15 fails to limit further the subject matter of claim 14.

Claim Rejections - 35 USC § 102 / 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
4. Claims 1-4, 6, 7, 9, 12, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Kirk *et al.* (U.S. 6,743,873).

Kirk *et al.* discloses a process for preparing crosslinked, epoxy functional porous organic polymer by incorporation of the epoxy group into the polymer chain by direct polymerization of an epoxy functional monomer such as glycidyl methacrylate (col. 4, lines 58-64). Working examples of crosslinked copolymers are prepared from glycidyl methacrylate and divinylbenzene. Epoxy functional monomer is present in an amount of 1-90 wt % (col. 16, line

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47). The polymer is used as a catalyst support. The metal component is a Pd(II) compound (col. 9, lines 5-16).

The catalyst of Kirk *et al.* is substantially the same as that recited in the instant claims, namely, a catalyst comprising crosslinked polymer and palladium catalyst physically carried on said crosslinked polymer and wherein the polymer is obtained by polymerizing a monomer of type (1), represented by structure [2]. The difference between the catalyst in Kirk *et al.* and that recited in the instant claims lies in the method of preparation of the catalyst. However, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

5. Claims 5, 10, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kirk *et al.* (U.S. 6,743,873).

The discussion of the disclosures of the prior art from the previous paragraph of this office action is incorporated here by reference. Kirk *et al.* does not disclose embodiments in which crosslinked copolymer is prepared with more than one functional group containing monomer, however, one having ordinary skill in the art gleans from the disclosure that the nature of the crosslinked copolymer is not particularly limited (polymers contain up to 89 wt % of vinyl aromatic monomer and alkyl (meth)acrylates, col. 16, lines 55-64, col. 18, lines 40-52), provided the copolymer contains epoxide functionality. Another example discloses preparation of functional porous organic polymer by direct polymerization of hydroxyl functional monomer such as hydroxypropyl methacrylate with divinyl benzene (col. 24, line 66-col. 15, line 17). The examples would have suggested to one having ordinary skill in the art that use of more than one type of functional group containing monomer allows for varying the level of crosslinking and porosity of the polymer support, and one skilled in the catalyst art would infer from the examples that porosity is varied to optimize catalyst loading and, in turn, catalyst activity. Therefore, it

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would have been obvious to one having ordinary skill in the art to make a crosslinked copolymer support comprising glycidyl methacrylate, divinylbenzene, and hydroxypropyl methacrylate, in order make an active catalyst with good activity, and one having ordinary skill in the art would have expected such a catalyst to work with a reasonable expectation of success.

6. Claims 1-4, 6, 7, 9, 10, 12 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Charmot *et al.* (U.S. 4,943,482).

Charmot *et al.* discloses particles of crosslinked polymer metallized on the surface with at least one zero valent metal. The polymer comprises 20-70 wt % of at least one noncomplexing monoethylenic monomer and up to 10 wt % of at least one ethylenically unsaturated carboxylic acid (claim 1). The ethylenically unsaturated carboxylic acid is (meth)acrylic acid (col. 2, line 11). An exemplary metal present on the surface of the polymer particle is palladium (col. 2, line 46). Surface metallization is achieved by contacting the particle with a Pd(II) salt followed by reduction to Pd(0); see example 2.

The catalyst of Charmot *et al.* is substantially the same as that recited in the instant claims, namely, a catalyst comprising crosslinked polymer and palladium catalyst physically carried on said crosslinked polymer and wherein the polymer is obtained by polymerizing a monomer of type (2), represented by structure [4]. The difference between the catalyst in Kirk *et al.* and that recited in the instant claims lies in the method of preparation of the catalyst. However, it is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

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7. Claims 1-7 and 9-17 are rejected under 35 U.S.C. 102(a) as being anticipated by Okamoto *et al.* (U.S. 2002/0045708).

Okamoto *et al.* discloses a metallic Lewis acid composition comprising the metallic Lewis acid carried on a crosslinked polymer formed by mixing non-crosslinked polymer with metal compound and then crosslinking the polymer (abstract, claims 1-23). Copolymers of vinyl glycidyl ether, styrene, and acrylic acid and vinylbenzyl glycidyl ether, (meth)acrylic acid, and styrene are exemplary (see structure, paragraph [0124]; claims 20-23). The metallic Lewis acid is palladium which is bound to halogen, as Pd(II) or carbonyl, as Pd(0); see paragraph [0128]. The composition, used as a catalyst, shows excellent solvent and heat resistance, and it is not degraded in activity after repeated use.

8. Claims 1-7 and 9-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Okamoto *et al.* (U.S. 6,716,792).

Okamoto *et al.* discloses a metallic Lewis acid composition comprising the metallic Lewis acid carried on a crosslinked polymer formed by mixing non-crosslinked polymer with metal compound and then crosslinking the polymer (abstract, claims 1-10 and 14-20). Copolymers of vinyl glycidyl ether, styrene, and acrylic acid and vinylbenzyl glycidyl ether, (meth)acrylic acid, and styrene are exemplary (see structure bridging columns 19 and 20, claims 5-8). The metallic Lewis acid is palladium which is bound to halogen, as Pd(II) or carbonyl, as Pd(0); see col. 21, lines 15-22. The composition, used as a catalyst, shows excellent solvent and heat resistance, and it is not degraded in activity after repeated use.

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

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9. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto *et al.* (U.S. 2002/0045708) in view of Kobayashi (JP 2002-253972).

The discussion of the disclosures of the prior art of Okamoto *et al.* from paragraph 7 of this office action is incorporated here by reference. Okamoto *et al.* does not disclose synthetic utility of palladium based catalysts. Kobayashi discloses polymer encapsulated palladium catalysts prepared by homogenizing polymer and a palladium (0) complex much in the same manner as that described in the invention of Okamoto *et al.* These palladium catalysts are especially useful for effecting allylic substitution using allyl carbonate (equation F). The combination of references would have suggested to one having ordinary skill in the art that the palladium catalyst of Okamoto *et al.* is well suited for catalyzing allylic substitution, and one having ordinary skill in the art would have been motivated to use the catalyst of Okamoto *et al.* for this purpose because it may be used repeatedly without losses in activity. Therefore, it would have been obvious to one having ordinary skill in the art to use the catalyst of Okamoto *et al.* for carrying out allylic substitution, and since Kobayashi teaches use of palladium catalysts for this purpose, one having ordinary skill in the art would have expected the catalyst of Okamoto *et al.* to work with a high degree of success. It also would have been obvious to one having ordinary skill in the art to use a palladium phosphine complex, as per Kobayashi, in lieu of a palladium carbonyl complex suggested in Okamoto *et al.* because experimental results in Kobayashi indicate that the phosphine complex is obtained readily and that phosphine ligands are sufficiently labile to yield free Pd(0) (page 3412, paragraph 3).

10. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto *et al.* (U.S. 2002/0045708) in view of Kaneda *et al.* (JP 2002-275116).

The discussion of the disclosures of the prior art of Okamoto *et al.* from paragraph 7 of this office action is incorporated here by reference. Okamoto *et al.* does not disclose synthetic utility of palladium based catalysts. Kaneda *et al.* discloses supported palladium catalysts that are especially useful for catalyzing mild oxidation of alcohols to their corresponding aldehydes and ketones (abstract). The combination of references would have suggested to one having ordinary skill in the art that the palladium catalyst of Okamoto *et al.* is well suited for catalyzing

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oxidation of alcohols, and one having ordinary skill in the art would have been motivated to use the catalyst of Okamoto *et al.* for this purpose because it may be used repeatedly without losses in activity. Therefore, it would have been obvious to one having ordinary skill in the art to use the catalyst of Okamoto *et al.* for carrying out oxidation reactions, and since Kaneda *et al.* teaches use of palladium catalysts for this purpose, one having ordinary skill in the art would have expected the catalyst of Okamoto *et al.* to work with a high degree of success.

11. Claims 1-10 and 12-19 are rejected under 35 U.S.C. 102(a) as being anticipated by Akiyama *et al.* (*J. Am. Chem. Soc.*, **2003**, 125, 3412-3413).

Akiyama *et al.* teaches the catalyst recited in the instant claims (Figure 1) for catalyzing allylic substitution reactions (Table 2). Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Response to Arguments

12. The rejection of claims 13 and 15 under 35 U.S.C. 112, 2nd paragraph, set forth in the previous office action dated August 2, 2007, has been withdrawn in view of appropriate amendments to claims.

The rejections of claims over Králik *et al.* (*J. Mol. Catal. A*, 1995), Corain *et al.* (*J. Mol. Catal. A*, 2001), Funaki *et al.* (U.S. 6,054,507), Tieke *et al.* (U.S. 5,045,436), and Toshima *et al.* (*Reactive Polymers*, 1991) have been overcome by amendment. Present claims define the chemical constitution of the crosslinked copolymer component of the catalyst. None of the cited references discloses or suggests a catalyst containing the crosslinked copolymer of the instant claims.

The rejection of claims over Kirk *et al.* (U.S. 6,743,873), set forth in the previous office action has been withdrawn. New grounds of rejection based on this reference has been presented in paragraphs 4 and 5 of this office action, *supra*.

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The rejection of claims over Charmot *et al.* (U.S. 4,943,482), set forth in the previous office action has been withdrawn. New grounds of rejection based on this reference has been presented in paragraph 6 of this office action.

Applicant's arguments with respect to claims Kirk *et al.* and Charmot *et al.* have been considered, but they are moot in view of the new ground(s) of rejection.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu S. Jagannathan, can be reached at (571)272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Art Unit 1796

May 19, 2008

/VASUDEVAN S. JAGANNATHAN/
Supervisory Patent Examiner, Art Unit 1796